

Claims

1. (Original) Catalyst system and process for the direct one-pot conversion of methane into acetic acid, under

relatively mild conditions, characterized by containing a vanadium complex, a peroxodisulfate salt and trifluoroacetic acid, without requiring the use of carbon monoxide.

2. (Original) Catalyst system and process according to claim 1, characterized by the use of a vanadium complex with the metal in the +4 or +5 oxidation state and with di- or poly-dentate ligands coordinated by nitrogen and/or oxygen atoms namely derived from aminoalcohols, (hydroxyimino)dicarboxylic acids, hydroxypyrones, trifluoroacetic acid or triflic acid.

3. (Original) Catalyst system and process according to claim 2, characterized by the use of carbon monoxide.

4. (New) A process for the direct one-pot conversion of methane into acetic acid, comprising combining methane with a catalytic system comprising a vanadium complex, a peroxodisulfate salt and trifluoroacetic acid, and reacting methane with the catalytic system in the pot under mild reaction conditions.

5. (New) The process of claim 4, wherein the vanadium complex comprises vanadium in the +4 or +5 oxidation state with one or more ligands selected from the group consisting of di- and poly-dentate ligands, coordinated by one of nitrogen and oxygen atoms, or oxygen and oxygen atoms, wherein said ligands are derived from aminoalcohols, (hydroxyimino)dicarboxylic acids, hydroxypyrones, trifluoroacetic acid or triflic acid.

6. (New) The process of claim 4, wherein the process is carried out in the substantial absence of carbon monoxide.

7. (New) The process of claim 4, wherein the process is carried out in the presence of carbon monoxide.

8. (New) A process for the conversion of methane into acetic acid, comprising reacting methane in a single pot with a catalytic system consisting essentially of a vanadium complex, a peroxodisulfate salt and trifluoroacetic acid.

9. (New) The process of claim 8, wherein the vanadium complex comprises vanadium in the +4 or +5 oxidation state with one or more ligands selected from the group consisting of di- and poly-dentate ligands, coordinated by one of nitrogen and oxygen atoms, or oxygen and oxygen atoms, wherein said ligands are derived from aminoalcohols, (hydroxyimino)dicarboxylic acids, hydroxypyrones, trifluoroacetic acid or triflic acid.